

High-Speed Fiber Optic Micromultiplexer for Space and Airborne Lidar, Phase I

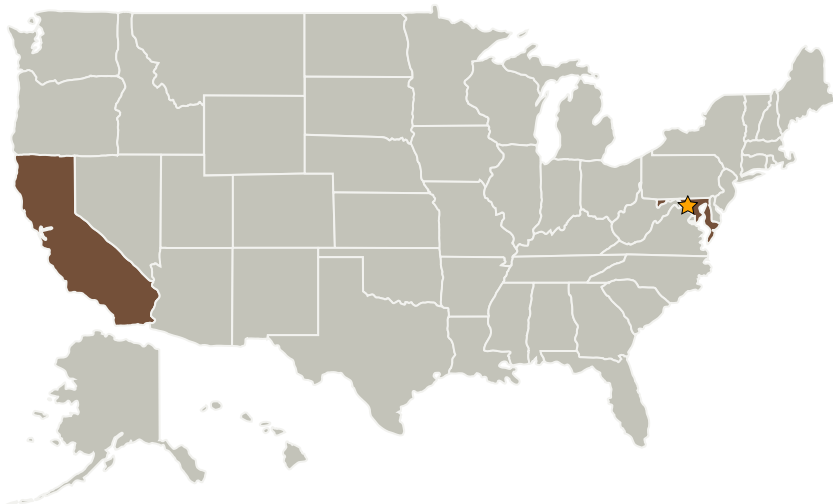
Completed Technology Project (2007 - 2007)



Project Introduction

To address the NASA Earth Science Division need for high-speed fiber optic multiplexers for next generation lidar systems, Luminet proposes to develop a new Fiber Optic Micromultiplexer (FOMM) based on InP/InGaAsP photonic integrated circuits (PIC) and digital optical switches (DOS). This approach makes innovative use of a modular expandable binary tree architecture for robust high-speed switching with a new application of the latest PIC and DOS technology. This approach enables us to design a lightweight (200 g), compact multiplexer that consumes only 1 A of electricity and can switch a fiber-coupled NIR laser transmitter among 16 single-mode fiber outputs in 4 ns while consuming only 5 W of electricity. In Phase I, Luminet will demonstrate the feasibility of ~20 ns switching and ~1 W laser power with a proof-of-principle 1-to-4 FOMM that has three electro-optical fiber switches, which will reduce the development risk of a Phase II 1-to-16 prototype that incorporates the PIC/DOS technology. The demonstrated results will offer NASA enhanced return signal and image resolution for lidar systems.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Luminet, LLC	Supporting Organization	Industry	Torrance, California



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.5 Lasers